

What is claimed is:

1. A magnetic memory array comprising a plurality of magnetic memories with respective ring-shaped magnetic layers therein,
said magnetic layers having respective notches formed by partially cutting out peripheries thereof in circular arc shape,
said magnetic memories being arranged in plane so that surfaces of said notches are parallel to one another.
2. The magnetic memory array as defined in claim 1, wherein said surfaces of said notches are set in parallel with a direction of an external magnetic field for recording.
3. The magnetic memory array as defined in claim 2, wherein a right-handed (clockwise) or a left-handed (anticlockwise) longitudinal magnetization is created in at least one of said magnetic layer by said external magnetic field.
4. The magnetic memory array as defined in claim 1, wherein if the height of each notch is defined as "h" and the outer diameter of each magnetic layer is defined as "H1", ratio (h/H1) is set to 0.01 or over.
5. The magnetic memory array as defined in claim 1, wherein each magnetic layer is made of room temperature ferromagnetic material.
6. The magnetic memory array as defined in claim 1, wherein the thickness of each magnetic layer is set within 1-10nm.
7. The magnetic memory array as defined in claim 1, wherein each magnetic memory comprises an additional magnetic layer on each magnetic layer via a non-magnetic layer.
8. The magnetic memory array as defined in claim 7, wherein said additional magnetic layer is made of room temperature ferromagnetic material.
9. The magnetic memory array as defined in claim 7, wherein the thickness of said additional magnetic layer is set within 1-10nm.
10. The magnetic memory array as defined in claim 7, wherein each magnetic memory comprises an antiferromagnetic layer which is formed adjacent to a main surface of said additional magnetic layer opposite to said each magnetic layer.
11. The magnetic memory array as defined in claim 7, wherein in said each magnetic memory, said additional magnetic layer is magnetized right

handedly (clockwise) or left handedly (anticlockwise) along a ring-shaped surface thereof.

12. The magnetic memory array as defined in claim 10, wherein the direction of magnetization in said additional magnetic layer is pinned.

13. A method for recording in a magnetic memory array, comprising the steps of:

preparing a plurality of magnetic memories with respective ring-shaped magnetic layers,

partially cutting out peripheries of said magnetic layers in circular arc shape to form respective notches therein,

arranging said magnetic memories so that surfaces of said notches are parallel to one another to form a magnetic memory array, and

applying an external magnetic field to said magnetic memory array to perform a recording operation for said magnetic memory array.

14. The recording method as defined in claim 13, wherein said external magnetic field is applied so as to be parallel to said surfaces of said notches.

15. The recording method as defined in claim 13, wherein a right-handed (clockwise) or a left-handed (anticlockwise) longitudinal magnetization is created in at least one of said magnetic memories.

16. The recording method as defined in claim 13, wherein if the height of each notch is defined as "h" and the outer diameter of each magnetic layer is defined as "H1", ratio (h/H1) is set to 0.01 or over.

17. The recording method as defined in claim 13, wherein said magnetic layers are made of room ferromagnetic material.

18. The recording method as defined in claim 13, wherein the thickness of each magnetic layer is set within 1-10nm.

19. A method for reading out from a magnetic memory array, comprising the steps of:

preparing a plurality of magnetic memories with respective ring-shaped magnetic layers,

partially cutting out peripheries of said magnetic layers in circular arc shape to form respective notches therein,

forming ring-shaped additional magnetic layers on said magnetic layers via

non-magnetic layers, respectively,

arranging said magnetic memories so that surfaces of said notches are parallel to one another to form a magnetic memory array, and

applying an external magnetic field to said magnetic memory array to perform a recording operation for said magnetic memory array and create a right-handed (clockwise) or a left-handed (anticlockwise) magnetization in at least one of said magnetic memories,

allotting information "0" or "1" to said right-handed (clockwise) or said left-handed (anticlockwise) magnetization, and

reading out said information "0" or "1" on the change in electric resistance of said at least one of said magnetic memories due to the relative direction in magnetization between said magnetic layer and said additional magnetic layer thereof.

20. The reading out method as defined in claim 19, further comprising the step of forming antiferromagnetic layers which are adjacent to main surfaces of said additional magnetic layers opposite to said magnetic layers to fix magnetizations of said additional magnetic layers, respectively.

21. The reading out method as defined in claim 19, wherein if the height of each notch is defined as "h" and the outer diameter of each magnetic layer is defined as "H1", ratio (h/H1) is set to 0.01 or over.

22. The reading out method as defined in claim 19, wherein said magnetic layers are made of room ferromagnetic material.

23. The reading out method as defined in claim 19, wherein the thickness of each magnetic layer is set within 1-10nm.

24. The reading out method as defined in claim 19, wherein the thickness of each additional magnetic layer is set within 1-10nm.